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ABSTRACT

The study, involving 119 academically handicapped third, fourth, and fifth graders, examined the effects of an instructional method (Team-Assisted Individualization) that combines cooperative learning with individualized learning in mathematics. Previous studies have found that the use of cooperative learning instructional processes can improve relations between normal-progress students and mainstreamed handicapped students; however, these processes incorporate class-paced instruction, which is generally not appropriate for handicapped students. Principal components of the Team-Assisted Individualization Program (TAI) were four- or five-member teams each with high, average, and low achievers; presentation of a diagnostic test at the beginning of the project on mathematics operations; individualized curriculum materials covering addition, subtraction, multiplication, division, numeration, decimals, fractions, and word problems; the team study method; team scores and team recognition; and teacher review sessions. A materials-only (MO) group used the same curriculum materials and procedures as the TAI group except the students worked individually and did not receive team scores or certificates. The control group used traditional methods for teaching mathematics. Ss were evaluated on sociometric measures, mathematics achievement, attitudes, and behavior ratings. Results confirmed the hypothesis that the cooperative individualized program for mathematics instruction (TAI) would increase the sociometric status of mainstreamed academically handicapped students. However, it appeared that the use of cooperation per se may not have been the critical component of the program, because the mainstreamed students in the groups using individualized curriculum materials only also improved significantly in sociometric status. (SW)

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Report No. 327
June 1982

EFFECTS OF COOPERATIVE LEARNING AND INDIVIDUALIZED INSTRUCTION ON THE SOCIAL ACCEPTANCE, ACHIEVEMENT, AND BEHAVIOR OF MAINSTREAMED STUDENTS

Robert E. Slavin, Nancy A. Madden and Marshall Leavey

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through five programs to achieve its objectives. The Studies in School Desegregation program applies the basic theories of social organization of schools to study the internal conditions of desegregated schools, the feasibility of alternative desegregation policies, and the interrelations of school desegregation with other equity issues such as housing and job desegregation. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. It has produced a large-scale study of the effects of open schools, has developed Student Team Learning instructional processes for teaching various subjects in elementary and secondary schools, and has produced a computerized system for school-wide attendance monitoring. The School Process and Career Development program is studying transitions from high school to post-secondary institutions and the role of schooling in the development of career plans and the actualization of labor market outcomes. The Studies in Delinquency and School Environments program is examining the interaction of school environments, school experiences, and individual characteristics in relation to in-school and later-life delinquency.

The Center also supports a Fellowships in Education Research program that provides opportunities for talented young researchers to conduct and publish significant research, and to encourage the participation of women and minorities in research on education.

This report, prepared by the School Organization program, examines the effects on mainstreamed students of using an instructional process in mathematics in which students work together in teams on individualized curricula.

Abstract

Previous studies have found that the use of cooperative learning instructional processes can improve relations between normal-progress students and mainstreamed students. However, these processes incorporate class-paced instruction, which is generally not appropriate for mainstreamed students.

This study examines the effects on mainstreamed students of an instructional method (Team-Assisted Individualization) that combines cooperative learning with individualized learning in mathematics. The sample consisted of 119 academically handicapped students in grades 3, 4, and 5 in four schools.

The Team-Assisted Individualization method, as well as an individualized method that did not use cooperative learning, both had significantly positive effects on the social acceptance of mainstreamed students by their classmates and on teachers' ratings of the students' behavior.

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Over the past decade, there has been an important change in the education of mildly academically handicapped students such as learning disabled and educable mentally retarded students. These students, who were once taught in self-contained classrooms, are now often mainstreamed in regular classes for part or all of their school day. The passage of PL94-142 accelerated the trend toward mainstreaming of such students whenever possible.

The academic benefits of mainstreaming are still a subject of controversy, but most research does show that mainstreamed students learn better than do similar students taught in self-contained classes (see, for example, Budoff & Gottlieb, 1976; Calhoun and Elliott, 1977: Meyers, MacMillan, and Yoshida, 1980: Walker, 1974). The same research also tends to find that mainstreaming, as opposed to segregated education, increases the acceptance of academically handicapped students by their peers. However, it is still the case that academically handicapped students in mainstreamed classrooms are poorly accepted and frequently rejected by their classmates (Bruininks, 1978: Bruininks, Rynders, & Gross, 1976: Bryan, 1974: Gottlieb, Semmel, & Veldman, 1978: Iano, Ayers, Heller, McGettigan, & Walker, 1974: Siperstein, Bopp, & Bak, 1978).

Because of these findings of poor acceptance and rejection, several researchers have developed and evaluated methods designed to improve the social acceptance of mainstreamed students. Most such methods use cooperative activity between mainstreamed and normal-progress students as a way to improve attitudes toward the mainstreamed students. The principle that cooperation increases liking among the cooperators is very well established in social psychology (see Johnson & Johnson, 1974; Slavin, 1977), and it

has been successfully applied to improvement of attitudes toward mainstreamed students by involving mainstreamed and normal-progress students in cooperative groups engaged in bowling (Johnson, Rynders, Johnson, Schmidt, & Haider, 1979), swimming (Martino & Johnson, 1979), planning skits (Chennault, 1967), planning a carnival (Rucker & Vincenzo, 1970), making a movie (Lilly, 1971), and preparing a multimedia class presentation (Ballard, Corman, Gottlieb, & Kaufman, 1977). These studies clearly demonstrate that cooperative activities between mainstreamed and normal-progress students improve relations between them.

When mainstreaming takes place in academic classes, cooperative learning activities can also be used to improve acceptance of the mainstreamed students. Cooper, Johnson, Johnson, & Wilderson (1980) and Johnson and Johnson (1981) found that when students worked in cooperative groups on academic materials, completing worksheets together and receiving praise as a group, acceptance of mainstreamed students increased. Madden and Slavin (1980) had students study in cooperative groups and then take individual tests, with test scores counting toward a team score. They found no effects on friendships toward mainstreamed students, but there was a significant reduction in rejections of mainstreamed students in the cooperative learning classes. Further, all students learned significantly more in the cooperative learning classes than in control classes.

Thus, it appears that cooperative activities involving mainstreamed academically handicapped students and their normal-progress classmates can be used in regular classes and can improve the social acceptance of the mainstreamed students. Further, when they are used, all students (mainstreamed as well as normal-progress) learn as well or better than students in traditionally taught classes.

However, there is one important limitation of these cooperative learning

methods in academic classes. The methods evaluated by Cooper, et al. (1980), Johnson & Johnson (1981), and Madden & Slavin (1980) all involved group-paced instruction; that is, the entire class studied the same material at the same rate. In a class containing low-performing mainstreamed students, group-paced instruction over the long run is likely to be inappropriate for students performing below the class mean, unless the entire class is held to their pace. Yet providing special instruction within the class for low-achieving mainstreamed students may isolate these students from their classmates and set them apart as odd or "special."

The present study was undertaken to evaluate an instructional method that combined cooperative learning with individualized instruction, in an attempt to realize the social benefits of cooperation between mainstreamed and normal-progress students and the academic benefits of providing students with instruction at their own level and rate. This combined cooperative-individualized program, called Team-Assisted Individualization, or TAI, was found in an earlier analysis (Slavin, Leavey, & Madden, 1982) to increase students' mathematics achievement in two separate studies. The present analysis examines data relating to the social acceptance, attitudes and behaviors, and academic achievement of mainstreamed students in the first of the Slavin, et al. (1982) studies.

Method

Subjects

The subjects were students in grades 3, 4, and 5 who were receiving special educational services for a learning problem (e.g., special education, reading or mathematics resource, speech) at least one hour per day. In the initial sample, there were 53 such "academically handicapped" students in twelve classes in four schools in a suburban Maryland school district (one third, fourth, and fifth grade class in each school). The schools were randomly assigned to experimental and control conditions, and then

classes containing the largest number of academically handicapped students at each grade level were chosen. After random assignment, one of the control schools refused to administer the sociometric and behavior rating scales (see below). For these measures only, a similar school was selected to be pre- and posttested. The original sample contained 117 academically handicapped students; the sample including the replacement school contained 119. In both cases, these students represented 29% of the total class population.

Treatments

Team-Assisted Individualization Program (TAI). The principal components of the TAI program were as follows:

1. Teams. Students were assigned to four- to five-member teams by the project staff. The teams had high, average, and low achievers as determined by a diagnostic test; boys and girls; and students of any ethnic groups in the class represented in the proportion they made up of the entire class. Students identified as receiving resource help for a learning problem were evenly distributed among the teams. Four weeks into the project, students were reassigned to new teams by their teachers according to the same procedures.

2. Diagnostic test. The students were pretested at the beginning of the project on mathematics operations. Students were placed at the appropriate point in the individualized program based on their performance on the diagnostic test.

3. Curriculum materials. For all of their mathematics instruction, students worked on individualized curriculum materials covering addition, subtraction, multiplication, division, numeration, decimals, fractions, and word problems. These materials had the following subparts:

--An Instruction Sheet explaining the skill to be mastered and giving a step-by-step method of solving problems.

--Several Skillsheets, each consisting of twenty problems. Each skillsheet introduced a subskill that led to final mastery of the entire skill.

--A Checkout, which consisted of two parallel sets of ten items.

--A Final Test.

--Answer Sheets for Skillsheets, Checkouts, and Final Tests.

4. Team Study Method. Following the diagnostic test, students were given a starting place in the individualized mathematics units. They worked on their units in their teams, following these steps:

--Students formed into pairs or triads within their teams. Each student located the unit that he or she was working on and brought it to the team area. Each unit consisted of the Instruction Sheet, Skillsheets, and Checkouts stapled together, and the Skillsheet Answers and Checkout Answers stapled together.

--In pairs, students exchanged Answer Sheets with their partners. In triads, they gave their Answer Sheets to the student on their left.

--Each student read his or her Instruction Sheet, asking teammates or the teacher for help if necessary.

--After they had read the Instruction Sheet, the students began with the first Skillsheet in the unit.

--Each student worked the first four problems on his or her own Skillsheet and then had his or her partner check the answers against the Answer Sheet. If all four were correct, the student could go on to the next Skillsheet. If any were wrong, the student had to try the next four problems, and so on until he or she got one block of four problems correct.

--When a student got four in a row correct on the last Skillsheet, he or she could take Checkout A, a ten-item quiz that resembled the last Skillsheet. On the Checkout, students worked alone until they were finished. When they were finished, a teammate scored the Checkout. If the student got eight or more correct, the teammate signed the Checkout to indicate the student was certified by the team to take the Final Test. If the student did not get eight correct, the teacher was called in to explain any problems the student was having. The teacher then asked the student to work again on certain Skillsheet items. The student then took Checkout B, a second ten-item test comparable in content and difficulty to Checkout A. Otherwise, students skipped Checkout B and went straight to the Final Test. No student could take the Final Test until he or she had been passed by a teammate on a Checkout.

--When a student "checked out," he or she took the Checkout to a student monitor from a different team to get the appropriate final test. The student then took the test and the monitor scored it. Three different students served as monitors each day.

5. Team Scores and Team Recognition. At the end of each week, the teacher computed a team score. This score was the sum of the average number correct of all tests taken by all team members (the Accuracy Score) and the average number of units covered by each team member times ten (the Progress Score). Criteria were established for team performance. A high criterion was set for a team to be a "SUPERTEAM," a moderate criterion was established for a team to be a "GREATTEAM," and a minimum criterion was set for a team to be a "GOODTEAM." The teams meeting the "SUPERTEAM" and "GREATTEAM" criteria received certificates.

6. Teacher Review Sessions. Every day, the teacher worked with single students or groups of two-to-ten students who were at about the same point in the curriculum for 5-15 minute sessions. The purpose of these sessions was to go over any points with which students were having trouble and to prepare students for upcoming units.

Materials-Only Program (MO). The MO group used the same curriculum materials and procedures as the TAI group with the following exceptions.

1. Students worked individually, not in teams. They checked their own answer sheets for all Skillsheets and Checkouts. Criteria for going on (i.e., four correct for Skillsheets and eight out of ten for Checkouts) were the same as for TAI.

2. Students did not receive team scores or certificates.

In all other respects, including curriculum organization, student monitors, teacher review sessions, and recordkeeping, the MO treatment was identical to TAI.

Control. The control groups used traditional methods for teaching mathematics, which consisted in every case of small homogeneous teacher-directed math groups and traditional texts.

Measures

Sociometric Measures. A peer rating form was used to construct measures of student acceptance of mainstreamed students. Each student was given a class list, and was asked to indicate whether he or she would consider each student on the list as a "best friend" or "O.K." Two measures were derived from this form. The first was the number of times a student was chosen as a "best friend" by his or her classmates. The second was the number of times a student was not listed either as a "best friend" or as "O.K." This measure was labeled "rejection."

Mathematics Achievement. The Mathematics Computation subscale of the Comprehensive Test of Basic Skills, Level 2, Form S, was administered as a pre- and posttest of student mathematics achievement. The CTBS (rather than a curriculum-specific test) was used to be sure experimental and control classes would have equal opportunities to have their learning be registered on the test.

Attitudes. Two eight-item attitude scales were given as pre- and posttests. The scales were Liking of Math Class (e.g., "This math class is the best part of my school day"), and Self-Concept in Math (e.g., "I'm proud of my math work in this class; I worry a lot when I have to take a math test"). For each item, students marked either YES!, yes, no, or NO! Scores of negatively scored items were reversed, so that high scale scores indicated more positive attitudes. Coefficient alpha reliabilities computed on the pretests for all students were as follows:

	Alpha
Liking of Math Class	.861
Self-Concept in Math	.770

Behavior Ratings. Teachers rated their academically handicapped students (plus six normal-progress students) on the School Social Behavior Rating Scale, or SSBRS. The SSBRS consists of four scales designed to elicit teacher ratings of student behavioral and interpersonal problems. The four scales were Classroom Behavior (e.g., "Does not attend to work"), Self-Confidence (e.g., "Becomes easily upset by failures"), Friendships (e.g., "Has few or no friends"), and Negative Peer Behavior (e.g., "Fights with other students"). There were six items in the Negative Peer Behavior Scale, and eight in the other three scales. A factor analysis using varimax rotation produced factor loadings consistent with the a priori scales. Coefficient alpha reliabilities computed on the pretests for all students were:

	Alpha
Classroom Behavior	.888
Self-Confidence	.882
Friendships	.938
Negative Peer Behavior	.914

Results

An analysis of variance conducted on the pretest means for mainstreamed and normal-progress students verified the assumption that mainstreamed students were substantially poorer in mathematics achievement and in sociometric status than normal-progress students (see Table 1). Mainstreamed students scored substantially below the mean for normal students on the Comprehensive Test of Basic Skills ($F(1,432) = 22.542$, $p < .001$). On the sociometric rating instrument, mainstreamed students also scored significantly below the mean for normal students on "best friends" ($F(1,496) = 11.63$, $p < .001$) and significantly above the normal students' means on rejection choices ($F(1,496) = 11.89$, $p < .001$). Mainstreamed students were also rated by their teachers as having a significantly greater number of problems in all of the rated areas, with means showing that mainstreamed students had far more problems than normal-progress students (see Table 1).

The data for the experiment were analyzed using analysis of covariance, with pretest and grade as covariates. Initial tests for possible pretest differences between groups indicated that there were no pretest differences at or beyond the .10 level for the CTBS pretests. On the sociometric measures, there were no pretest differences between groups on number of "best friends" or on "rejection." On the behavioral rating data, no pretest differences were found on classroom behavior or negative peer behavior, but the control group showed marginally fewer problems in self-confidence ($F(2,96) = 2.713$, $p < .08$) and the MO group showed a greater number of problems with friendship behavior ($F(2,96) = 3.14$, $p < .05$). No pretest differences were found on the attitude scales.

The pre- and posttest means for all dependent variables are presented in Table 2. Table 3 presents the results of the analyses of covariance, including both the overall (3 x 1) results and each of the pairwise comparisons.

The analyses of the sociometric data were restricted to choices of mainstreamed boys since there were no mainstreamed girls in the control group sample and only three in the MO group sample. Analysis was further restricted to within-sex choices, as cross-sex choices are rare in an elementary school sample (DeVries and Edwards, 1974; Lott and Lott, 1965).

The analyses of the sociometric data indicate overall treatment effects, controlling for pretest and grade, for both "best friends" ($F(2,58) = 2.98$, $p < .06$) and "rejections" ($F(2,58) = 4.55$, $p < .02$). On choices of "best friends," the cooperative individualized group (TAI) gained significantly more than the control group ($F(1,41) = 5.91$, $p < .02$) as did the materials only (MO) group ($F(1,37) = 4.81$, $p < .04$). There were no differences between the TAI and MO groups. The same pattern was seen for "rejection" choices. The TAI group was again superior to control ($F(1,41) = 6.36$, $p < .02$), as was the MO group ($F(1,37) = 5.32$, $p < .03$).

Analyses of the behavioral rating data showed significant overall treatment effects beyond the .01 level for all four measures (see Tables 2 and 3). For Classroom Behavior, TAI students were rated as having significantly fewer problems than control students ($F(1,61) = 28.10$, $p < .001$) and fewer than MO students ($F(1,55) = 10.37$, $p < .002$). No differences were found between MO and control students ($F(1,70) < 1$, n.s.). On the Self-Confidence scale, again TAI students were rated as having fewer problems than control students ($F(1,61) = 31.87$, $p < .001$) and MO students ($F(1,50) = 5.65$, $p < .05$), and, again, no differences were found between MO and control

groups. On the Friendships and Negative Peer Behavior scales, a slightly different pattern emerged. For Friendships, TAI students were rated as having fewer problems than control students ($F(1,61) = 14,82$, $p < .001$) and MO students were rated as having fewer problems than control students ($F(1,70) = 12.66$, $p < .001$). No differences were found between TAI and MO groups ($F(1,55) < 1$, n.s.). Similarly, on the Negative Peer Behavior measure, TAI students were rated as having fewer problems than control students ($F(1,54) = 22.15$, $p < .001$) and MO students were also rated as having fewer problems than control students ($F(1,70) = 32.70$, $p < .001$). Again, no differences were seen between TAI and MO groups ($F(1,48)$ 1, n.s.).

On the CTBS, the overall analysis of covariance showed no treatment effects ($F(2,93) = 1.44$, n.s.), as did all of the pairwise comparisons (see Table 2).

Analysis of the attitude scales showed only marginally significant findings for the overall analyses of treatment differences for Liking of Math Class ($F(2,98) = 2.66$, $p < .08$) and for Self-Concept in Math ($F(2,9^{\circ}) = 2.45$, $p < .10$). TAI students had marginally more positive attitudes toward math class than did control students ($F(1,62) = 3.69$, $p < .06$), as did MO students ($F(1,72) = 3.40$, $p < .07$). No differences were seen between TAI and MO students. On the Self-Concept in Math scale, TAI students showed marginally higher self-concepts than MO students ($F(1,60) = 3.67$, $p < .06$). No differences were found between TAI and control groups ($F(1,62) = 1.10$, n.s.) or between MO and control groups ($F(1,72) = 1.79$, n.s.).

A comparison of the posttest means for mainstreamed and normal-progress students on the behavior ratings scales reveals that scores for the mainstreamed students began to approximate the scores for normal-progress students (see Table 4). On three of the scales, mainstreamed students in the

TAI group were rated as having fewer problems than normal-progress students in the control group. Mainstreamed students in the control condition continued to be rated as having two-to-three times the problem score as their normal-progress peers on all scales.

Discussion

The results of this study confirm the hypothesis that the cooperative individualized program for mathematics instruction (Team-Assisted Individualization) would increase the sociometric status of mainstreamed academically handicapped students, as indicated by the increased numbers of choices they received as "best friends" and the decreased number of "rejections" received. However, it appears that the use of cooperation per se may not have been the critical component of the program, because the mainstreamed students in the groups using the individualized curriculum materials only also improved significantly in sociometric status. This finding appears to be contrary to previous reserach and theory. However, informal observations within the classes during the study indicated that students within the groups using the individualized curriculum materials only actually interacted frequently while studying those materials. Thus, more interaction between students was available in the cooperative groups and in the materials-only group than was available in the traditionally taught classes. Cooper, et al. (1980) showed that increased interaction between students led to increased friendships regardless of whether the interaction was cooperative or competitive, and Slavin (in press) has speculated that in schools, duration and quality of contact between students may be more important in predicting social relationships between students than the reward structure under which contact occurs.

It appears, based on the data from the behavior rating scales, that this increase in interaction may also have resulted in changes in student-

to-student interactions in the classroom as observed by the teacher. Both the mainstreamed students in the cooperative-individualized (TAI) curriculum and those in the materials-only (MO) groups were rated as having fewer problems in relating to other students as friends and as showing fewer negative peer interactions. However, only the students in the TAI program showed an improvement on teacher ratings of classroom behavior and self-confidence. It would thus appear that the cooperative reward structure provided an additional incentive to students in these areas. It may be that the team members, having an interest in the productivity of other group members, applied peer pressure to keep inattentive or disruptive students on task. The growth in self-confidence for students in the cooperatively taught groups may have resulted from their teammates' recognition and support for their success.

The comparison of means for mainstreamed and normal-progress students on the behavior ratings scales shows that in the cooperative program, the behavior of mainstreamed students (as rated by their teachers) became quite similar to that of normal-progress students. This fact may have a significant influence not only on how peers perceive mainstreamed students, but on the attitudes of teachers toward mainstreamed students. Attitude surveys frequently indicate that teachers resist the inclusion of mainstreamed students in their classrooms, partly because they do not wish to have their classes disrupted by children with problems who require a substantial proportion of time simply for management (Harasymiw & Horne, 1976). Clearly, within the cooperative program, mainstreamed students would be much less likely to stand out as management problems.

The use of the individualized curriculum itself may also explain the findings of improved peer relationships and increased friendship-related

behaviors directed toward mainstreamed students. The structure of the individualized curriculum may reduce the perceived differences between normal-progress and mainstreamed students. In a traditional classroom, the mainstreamed students might appear in the lowest math group, or might be singled out for special attention by the teacher. In lessons involving questions and answers, classmates might see them struggle with their math. In contrast, in individualized instruction, mainstreamed students proceed through the same curriculum under the same guidelines as other students; they are no longer "special." The fact of their low achievement may become less salient as they make progress in the same way as other students.

The failure to find differences in mathematics achievement between the different treatment groups was unanticipated. In the analyses of the full sample (Slavin, Leavey, and Madden, 1982) TAI students gained significantly more in achievement than control students. The differences between TAI and control students were large; the TAI students gained twice as many grade equivalents as the control students. The same ratio was found in a second study reported by Slavin, Leavey and Madden (1982) comparing TAI to control. In theory, the use of individualized instruction should have been especially beneficial for the mainstreamed students, whose needs should be least likely to be met in an instructional method not able to provide instruction at many levels. Actually, with regard to mathematics achievement, the three treatments were equally ineffective, rather than equally effective; in no case did the achievement scores for mainstreamed students significantly change from pre- to posttest.

The failure to find positive effects of the individualized programs on the mathematics achievement of the mainstreamed students was also surprising in the light of anecdotal reports that many of the mainstreamed students responded dramatically to the individualized programs (particularly

TAI), moved rapidly through the materials, and experienced great satisfaction at being able to do so. This sense of satisfaction appears to have been expressed in the marginally greater liking for math class seen for students in both individualized conditions as compared to control students, but it did not result in greater achievement.

It may be that the failure to find positive effects of the individualized program on the achievement of the mainstreamed students is due to the fact that the individualized materials require more reading than is typically needed in mathematics classes. Those students receiving special services primarily for reading problems might therefore have had considerable difficulty, and the peer tutoring and teacher instruction available to these students may not have been sufficient to overcome this difficulty. If this is true, it may be important in future applications of individualized programs in mainstreamed classes to provide audio cassettes explaining each unit, or to provide additional help for students with reading problems, thereby maintaining the social advantages of individualized instruction documented in this study while doing more to meet the particular needs of mainstreamed students with reading problems.

It is important to note that while the experimental treatments did not affect the achievement of the mainstreamed students, they did have a significantly positive effect on the achievement of the classes taken as a whole (see Slavin, Leavey, & Madden, 1982). This is important for the mainstreamed students because teachers of classes with mainstreamed students would be unlikely to use an instructional method that did not improve learning outcomes for all of their students.

In summary, the results of this study show that both the cooperative-individualized program (TAI) and the individualized program without cooperative

teams had positive effects on the social acceptance and socially related behavior ratings of mainstreamed students, but not on their achievement. The team component appeared to add to the impact of the individualized materials themselves, as was seen in the improvements in teacher ratings of classroom behavior and self-confidence for mainstreamed students who were involved in teams, to the point where their behavior ratings were very similar to those of normal students in the control group.

Further research is needed to explore the positive social effects of individualization per se for mainstreamed students. The positive effects of cooperation were anticipated, based on a long tradition of research on the effects of cooperative learning on relationships between normal-progress and mainstreamed students, blacks and whites, and so on. However, there is little known about the social effects of individualized instruction. The present investigation is a first step in understanding these effects, as well as a further step in understanding the social effects of cooperative learning for mainstreamed students.

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TABLE 1

Means and Analyses of Variance for the Comparison of Normal-Progress and Mainstreamed Students on Achievement, Sociometric, and Behavior Rating Measures at Pretest

	Mainstreamed Students		Normal-Progress Students	
	Mean	S.D.	Mean	S.D.
Achievement				
CTBS	24.75	11.25	30.61	10.60
	N = 98		N = 336	
Analysis	$F(1,432) = 22.54$, $p < .001$			
Sociometric Measures				
"Best Friends"	6.61	4.52	8.11	4.01
	N = 116		N = 382	
Analysis	$F(1,496) = 11.63$, $p < .001$			
"Rejection"	9.87	5.27	8.22	4.25
	N = 116		N = 382	
Analysis	$F(1,496) = 11.89$, $p < .001$			
Behavioral Ratings (a higher rating indicates more or more intense problems)				
Classroom Behavior	6.93	6.62	3.90	4.64
	N = 99		N = 111	
Analysis	$F(1,208) = 14.99$, $p < .001$			
Negative Peer Behavior	2.85	4.17	1.18	2.20
	N = 99		N = 111	
Analysis	$F(1,208) = 13.57$, $p < .001$			
Friendship Behavior	3.77	5.66	1.89	4.15
	N = 99		N = 111	
Analysis	$F(1,208) = 7.69$, $p < .01$			
Self-Confidence Behavior	5.20	5.13	1.91	2.47
	N = 99		N = 111	
Analysis	$F(1,208) = 36.29$, $p < .001$			

TABLE 2

Means and Standard Deviations of Sociometric, Behavior Rating, Achievement, and Attitude Variables by Treatment

		TAI		MO		Control	
		X	S.D.	X	S.D.	X	S.D.
"Best Friends"							
	Pre	5.86	3.21	4.34	3.68	4.54	2.84
	Post	6.04	3.02	4.61	3.66	4.00	2.08
	N	22		18		23	
"Rejections"	Pre	2.85	2.37	4.52	2.88	4.22	2.92
	Post	2.49	2.43	3.60	2.72	4.77	2.65
	N	22		18		23	
Behavior Rating: Classroom Behavior	Pre	7.48	5.47	6.06	7.20	7.33	6.85
	Post	3.84	2.70	8.29	9.77	8.35	6.42
	N	25		34		40	
Behavior Rating: Self-Confidence	Pre	6.00	4.14	7.07	6.51	3.77	4.26
	Post	2.84	3.20	6.17	6.40	5.10	5.18
	N	25		29		40	
Behavior Rating: Friendships	Pre	2.88	3.89	5.71	7.90	2.70	3.67
	Post	1.80	3.91	3.26	4.66	4.20	4.18
	N	25		34		40	
Behavior Rating: Negative Peer Behavior	Pre	2.88	3.46	3.00	5.20	2.70	3.65
	Post	1.17	2.60	1.62	3.11	4.15	4.20
	N	18		34		40	
CTBS	Pre	27.6	12.1	22.8	10.3	24.9	11.5
	Post	27.2	12.3	25.3	11.6	25.4	13.0
	N	22		36		40	
Liking of Math Class	Pre	14.2	5.25	14.4	5.17	16.3	4.34
	Post	14.4	5.69	14.9	6.05	18.1	5.52
	N	27		37		39	
Self-Concept in Math	Pre	16.1	4.57	15.8	5.44	16.6	3.54
	Post	14.7	4.78	16.5	5.29	15.8	3.38
	N	27		37		39	

TABLE 3

Results of Analyses of Covariance
for Sociometric, Behavior Rating, Achievement, and Attitude Measures

	F	d.f.	p <	Direction
"Best Friends"				
Overall	2.98	2,58	.06	
TAI vs. Control	5.91	1,41	.02	TAI > C
TAI vs. MO	<1	1,36	n.s.	
MO vs. Control	4.81	1,37	.04	MO > C
"Rejections"				
Overall	4.55	2,58	02	
TAI vs. Control	6.36	1,41	02	TAI > C
TAI vs. MO	1	1.36	n.s.	
MO vs. Control	5.32	1,37	.03	MO > C
Behavior Ratings:				
Classroom Behavior				
Overall	8.87	2,94	.01	
TAI vs. Control	28.10	1,61	.001	TAI > C
TAI vs. MO	10.37	1,55	.002	TAI > C
MO vs. Control	<1	1,70	n.s.	
Behavior Ratings:				
Self-Confidence				
Overall	8.56	2,89	.001	
TAI vs. Control	31.87	1,61	.001	TAI > C
TAI vs. MO	5.65	1,50	.03	TAI > MO
MO vs. Control	3.09	1,65	.09	MO > C
Behavior Ratings:				
Friendships				
Overall	7.97	2,94	.001	
TAI vs. Control	14.82	1,61	.001	TAI > C
TAI vs. MO	<1	1,55	n.s.	
MO vs. Control	12.66	1,70	.001	MO > C
Behavior Ratings:				
Negative Peer Behavior				
Overall	17.09	2,87	.001	
TAI vs. Control	22.15	1,54	.001	TAI > C
TAI vs. MO	<1	1, 48	n.s.	
MO vs. Control	32.70	1,70	.001	MO > C
CTBS				
Overall	1.44	2,93	n.s.	
TAI vs. Control	<1	1,58	n.s.	
TAI vs. MO	2.24	1,54	n.s.	
MO vs. Control	1.54	1,72	n.s	
Liking of Math Class				
Overall	2.66	2,98	.08	
TAI vs. Control	3.69	1,62	.06	TAI > C
TAI vs. MO	<1	1,60	n.s.	
MO vs. Control	3.40	1,72	.07	MO > C
Self-Concept in Math				
Overall	2.45	2,98	.10	
TAI vs. Control	1.10	1,62	n.s.	
TAI vs. MO	3.67	1,60	.06	TAI > MO
MO vs. Control	1.79	1,72	n.s.	

TABLE 4

Means for Mainstreamed and Normal-Progress Students for Behavior Ratings at Pre- and Posttest

	Mainstreamed Students			Normal-Progress Students		
	Pre	Post	(N)	Pre	Post	(N)
Classroom Behavior						
TAI	7.48	3.84	(25)	3.99	2.79	(33)
MO	6.06	8.29	(34)	3.74	3.26	(34)
Control	7.32	8.35	(40)	3.98	4.35	(43)
Self-Confidence						
TAI	6.00	2.84	(25)	2.42	1.18	(33)
MO	6.29	6.17	(29)	1.85	1.34	(29)
Control	3.77	5.10	(40)	1.57	2.55	(43)
Friendship Behavior						
TAI	2.88	1.80	(25)	1.24	1.39	(33)
MO	5.71	3.26	(34)	3.21	2.30	(33)
Control	2.70	4.20	(40)	1.36	2.21	(43)
Negative Peer Behavior						
TAI	2.88	1.26	(18)	1.36	.54	(22)
MO	3.00	1.62	(34)	1.21	.70	(33)
Control	2.70	4.25	(40)	1.02	1.67	(43)